Pack Size, Reported Cigarette Smoking Rates, and Public Health

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Abstract: The relation between packs containing 25 or 20 cigarettes each and self-reports of daily cigarette intake was examined in surveys of smoking habits from the United States and Canada. More Canadian than US smokers report smoking 25 cigarettes per day (19.3 per cent vs 2.1 per cent). As market share of packs of 25 increases across six regions in North America, reports of smoking 25 cigarettes per day increase. Even if smoke exposure remains constant, smoking statistics are likely to be influenced by pack size. (*Am J Public Health* 1986; 76:1337–1338.)

Introduction

Almost 40 years ago, British tobacconists sold cigarettes in packs of 5, 10, 12, 15, 20, 24, 25, 30, 50, and 100.[1] The British market has long since adopted a nearly standard pack of 20 cigarettes, and until recently, a pack of cigarettes in the United States contained 20 cigarettes. The best-selling brand of cigarettes has now started to be sold in packs of 25 in those 46 States which do not tax 25s at a disproportionally high rate;[2] and since 1983, at least two brands have been sold only in packs of 25.[3] Packs of 25 in the US are usually, although not always, promoted as economical alternatives to 20s.[4] Packs of 25 have been common in Canada for many years. Most (81 per cent) of the cigarette packs sold in Canada in 1984 were packs of 25.

A "digit-bias" in self-reports of daily cigarette intake is well-known.[5,6] Vogt, *et al*,[5] noted that half of the reports of daily cigarette intake were either 20, 30, or 40 cigarettes per day. To explore the effect of pack size on self-reports of smoking, two large government surveys of smoking habits (one US, one Canadian) were examined.[7,8]

Methods

Public access tapes of the Canada Health Survey (CHS) of 1978–79,[7] and of the National Interview Health Survey (NIHS) 1979,[8] were analyzed for the frequency distribution of the number of cigarettes smoked per day for all current daily smokers aged 20 or above. The CHS, but not the NIHS, tape used a "40+" category for number of cigarettes smoked per day. The Z-test evaluated the US/Canadian difference in proportion of smokers reporting 25 cigarettes per day. (Error terms were not adjusted for survey "design effects.")

Regional Analyses.

Provincial market share data* were combined (weighted by the number of CHS sampling clusters in the various Provinces) to estimate market share of 25s for the Atlantic Region (At), Quebec (Qu), Ontario (On), Prairie Region (Pr), and British Columbia (BC). The least-squares linear association between percentage of packs of 25 (out of all packs sold) and the self-reports of 25 (out of all reports of 25 and 20) was examined. (This self-report index was used to focus on reports in the 20–25 "pack" range.) Assuming the market share for 25s in the US was 0.0 in the late 1970s, the US was treated as another region.

Results

The number 25 is rarely used by US smokers, yet it is the second most common number for Canadian smokers. The difference in proportions (.172, 95% CL: .163, .182) is substantial (see Figure 1).

In North America, as self-reports of 25s increase, the sales of 25s increase (r(5) = .975, 95% CL: .78, .99) (see Figure 2). Within Canada alone, there is still a strong association (r(4) = .989, 95% CL: .85, .99).

Discussion

Self-report Issues

Self-reports of daily smoking rates are crucial tools for many who study cigarette smoking. As the cigarette market for packs of 25s grows in the US, self-reported smoking rates should change systematically. Some future trends in smoking rates (as seen on routine surveys of smoking habits) may be due more to the artifact of a new digit biasing the system, than to true changes in smoking rates.

Often a "pack" of cigarettes has been a key cut-off point in studies of smoking. More and more, one pack of cigarettes might contain 25 per cent more cigarettes than another pack of cigarettes. Researchers should be encouraged again[9] to ask smokers for the number of cigarettes smoked each day, rather than for a response on some rating scale of cigarette intake; and they should ask whether the smoker usually buys packs of 20 or 25, to be able in the future to test if pack size is associated with disease risk.

Behavioral Issues

Are there pressures to smoke them, if you have them? The increased availability of 25s may promote heavier smoking (i.e., greater exposure to toxins). However, if 25s reduce the number of 30 or 40 per day smokers, they may have net public health benefits. A look at the relationship between market share and mean self-reported daily intake in

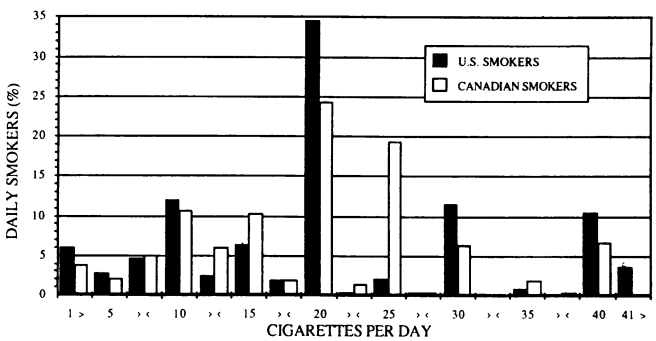

FIGURE 1—Frequency Distribution of the Number of Cigarettes Reported Smoked per Day by Current Daily Smokers (age 20 or above) in Canada (N = 6,662) and the United States (N = 7,316)

*The Bureau of Tobacco Control and Biometrics, Health and Welfare Canada, provided a summary of the earliest available market data (1983) from the Canadian Tobacco Manufacturers Council.

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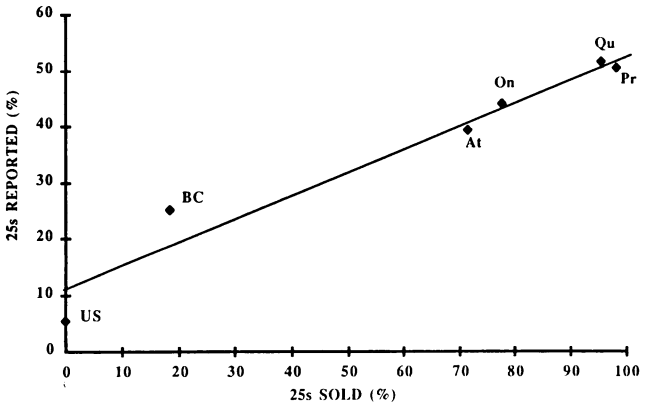

FIGURE 2—Self-reported Daily Smoking Rates (% of 25 out of 25 and 20) as a Function of Packs of 25s Sold (% out of all packs) in Six North American Regions

the six North American regions found no important effects, but no adjustments were made for any of the well-known cultural and economic influences on cigarette consumption[10–12] or for influences on underreporting of cigarette intake.[13]

Anecdotally, Canadian smokers sometimes switch from 25s to 20s as a way to cut down their smoking. Just as it is possible to compensate for lower-yield cigarettes by oversmoking each cigarette,[14,15] it is possible to compensate for a 25 per cent reduction in cigarette number by smoking more of each cigarette. Experimental research, employing biochemical indicators of cigarette exposure,[16] will be needed to determine—other factors being held constant—the effects of pack size on smoke exposure. If pack size influences smoke exposure (and hence, the health consequences of smoking), understanding this effect would be extremely important, in part because pack size would be one of the more modifiable features of cigarette intake. One packaging manufacturer indicates that they can readily provide packs of 10, 12, 14, 20, 25, or 30.[17] (Packs of 30 have recently been introduced in Canada.) Differential taxes or even regulations concerning pack size might be considered.[18]

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